

ORIGINAL
ResearchSusan M. Friedman, MD, MPH¹, Carol Hee Barnett, PhD, JD,
Robert Franki, MA, Bruce Pollock, MBA, Beth Garver, MS,
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15-Day Whole-Food Plant-Based
Program

Abstract: *The 15-day Jumpstart was developed as an evidence-based, affordable, standardized, replicable, and scalable program, designed to demonstrate quickly to patients that changing what they eat can improve their health. The program was designed using the principles of the self-determination theory of motivation and personality. Patients were instructed to eat an Esselstyn-compliant, whole-food plant-based diet consisting of vegetables, fruits, whole grains, and legumes. Of the 389 participants in the program from September 2018 to February 2020, average weight loss was 5.8 pounds (7.3 for those whose body mass index was >30), average systolic blood pressure drop was 6.8 points (16.8 points for those with systolic blood pressure >140), average drop in cholesterol was 26 points (44 points for those with a cholesterol >200), average drop in low-density lipoprotein was 19 points (33 points for those with a low-density lipoprotein >100), and average drop in fasting blood sugar was 5.1 points (28.4 points for those starting in the diabetic range); P value was <.005 for fasting blood sugar and <.001 for all other comparisons. A 15-day program that helps patients adopt an Esselstyn-style whole-food*

plant-based diet, through education, individualized medical feedback, social support, and facilitated small group work, rapidly improves health.

Keywords: nutrition; lifestyle medicine; hypertension; hyperlipidemia

Chronic disease is ubiquitous in this country. We are experiencing higher prevalence and earlier onset of many chronic conditions in recent decades. Escaping chronic illness is an increasingly rare phenomenon, and today more than 90% of adults aged 65 and over have one or more chronic diseases.¹ The typical progression with age is one of more illness, more medications, more functional impairment—and, with this, lower quality of life.^{2,3} Fortunately, this progression is not inevitable. The literature has shown that by adhering to a few straightforward lifestyle principles, the majority of the most common chronic diseases can be delayed or avoided.^{4,5}

The lifestyle risk factors conferring the greatest impact on mortality in the United States have changed over recent decades. Where tobacco was the strongest contributor to early death in 1990,⁶ diet

has become the leading risk factor for mortality today.⁷ The standard American diet is one that is high in meat, dairy, and processed food. According to a 2010 report from the National Cancer Institute, only 11% of adults eat the recommended servings of vegetables, only 20% meet recommendations for fruit, and less than 4% meet the recommendations for legumes.⁸ Meeting these targets would go a long way toward improving health.⁹ Further health benefits could accrue from adopting a low-fat, whole-food plant-based (WFPB) diet,¹⁰ which has been shown to prevent, treat, and even reverse chronic conditions, such as hyperlipidemia,^{11,12} hypertension,¹¹ diabetes,¹³ and heart disease.^{14,15}

Recognizing the power of nutrition to reduce the impact of chronic illness, successful interventions have been developed that incorporate educating patients about a WFPB diet.^{12,16} As one prime example, over the past 30 years, CHIP (the Complete Health Improvement Program) has treated over 60 000 people, leading to significant health improvements through participation in an organized program that gives instruction and support.¹² The Ornish Program for Reversing Heart Disease uses a low-fat, plant-focused diet as part of a multifaceted lifestyle intervention to treat heart disease.^{16,17}

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Unfortunately, there are barriers that have prevented these beneficial programs from being more widely adopted in a clinical setting. First, these programs are lengthy, requiring significant time commitment from patients. Additionally, there is significant confusion among the public about which dietary approach is most optimal for health. A program that rapidly enables patients to assess for themselves how they feel will help them recognize what works for them.

Furthermore, in the case of the Ornish program, considerable staffing and training are necessary, limiting the availability of this program. Lifestyle medicine practitioners need a program that they can incorporate into their practice utilizing the current reimbursement structure and applicable in a clinic setting.

We sought to develop a program that (1) is evidence-based; (2) quickly demonstrates to patients that changing what they eat can improve health; (3) is affordable to patients; (4) is standardized and can be replicated by practicing clinicians, without additional equipment or substantial additional training; and (5) can be scaled rapidly, to reach patients across the country and across the world.

Methods

Development of the 15-Day Jumpstart (JS) Program

The JS was designed as an in-person program starting in July 2018, using an iterative process, via the Plan-Do-Study-Act approach.¹⁸ The program was given monthly. A 6-person team met weekly to review each piece of the program, using team observation as well as feedback from patients, facilitators, and volunteers. A quality improvement program was developed to review outcomes. Educational handouts were developed and assembled into a JS guide. Daily emails were designed and automated. The program started with in-person didactics, and over time, a video for each of days 1, 8, and 15 was completed. In April 2019, an optional cooking demonstration was added on day 2 of

the program, to enable patients to taste new items, get WFPB cooking tips, and gather new recipes.

The program was designed using the principles of the self-determination theory (SDT) of motivation and personality.^{19,20} SDT posits that humans are inherently proactive—that we continue to grow, and strive to be our “best selves.” It is built on a framework of 3 basic psychological needs, namely, autonomy, competence, and relatedness. Autonomy is the urge to be a causal agent and to act volitionally in accord with one’s sense of self. Autonomy denotes willingness and choice in one’s actions. Competence is the inherent desire to be effective in dealing with one’s environment, and it develops continually throughout life. Relatedness is the desire to interact with, connect to, and experience caring for other people. Table 1 outlines how each of these elements was incorporated into the JS program.

The program also accommodated the understanding that adult learners have different strengths and approaches to learning. For this reason, the program incorporated several different modalities, including reading, individual and small group discussion, problem-solving activities, videos, and hands-on practice with skill building.

The 15-Day Jumpstart Program

The JS program was designed by the Rochester Lifestyle Medicine Institute, a nonprofit organization established with a mission “to establish Lifestyle Medicine, especially the adoption of WFPB nutrition, as the foundation for health and the healthcare system.” The program is medically supervised and administered over 15 days. The components of the JS program are depicted in Figure 1.

Each JS enrolls approximately 24 patients. Patients are seen in person on days 1, 8, and 15. On day 1, patients have baseline biometrics and fasting labs at the center. Labs are reviewed one-on-one with the medical provider, before each patient joins the group for a WFPB

breakfast. Patients sit with each other in groups of 6 people, for small group activities. They are each given a JS guide, which reviews the rationale for a WFPB diet, provides some recipes, and contains a place to track outcomes. They have multimodal education, including videotaped didactics, small group discussions and problem solving, menu planning, and questions and answers with the provider involving the entire group. A JS-compliant lunch is served. The session lasts about 5 hours.

Since April 2019, an optional cooking demonstration was held on day 2 of the program. This demonstration teaches skills in food preparation and storage, and provides samples of several different dishes and recipes for everything that is prepared. The cooking class lasts about 3 hours.

On day 8, patients return to take part in a potluck lunch. There is a facilitated discussion of each dish, and patients share recipes. A medical provider spends time answering questions posed by the group. The potluck lasts 2 hours.

On day 15, patients return for fasting labs and biometrics, with a one-on-one review by the medical provider. They convene as a group, eat breakfast, have more education, meet as a group with the provider for questions and answers, discuss next steps, celebrate outcomes, and participate in a graduation ceremony. This session lasts approximately 3.5 hours.

Patients are counseled to eat an Esselstyn-compliant WFPB diet throughout the JS program. Dr Caldwell Esselstyn founded the Cardiovascular Disease Prevention and Reversal program at the Cleveland Clinic. He demonstrated that a very low-fat, WFPB diet could arrest and reverse coronary artery disease.^{14,15,21} Table 2 summarizes the components of this dietary pattern. The 4 main food groups in this eating pattern are vegetables, fruits, whole grains, and legumes (beans, peas, and lentils). Animal products are excluded. High-fat plant foods (eg, nuts, nut and seed butters, olives, avocado, and coconut) are excluded, as are processed

Table 1.

Components of Self-Determination Theory Incorporated Into the Jumpstart Program.

Autonomy
<ul style="list-style-type: none"> • People choose to enroll.
<ul style="list-style-type: none"> • People choose the foods they buy, cook, and eat.
<ul style="list-style-type: none"> • People choose whether to be compliant or not.
<ul style="list-style-type: none"> • Patients are asked why they are participating in this program. Why is it important to them?
<ul style="list-style-type: none"> • Discussion of issues that may help with motivation (eg, “I am eating this way because I want to be healthy”; “I am eating this way because it also helps the planet”).
<ul style="list-style-type: none"> • People choose whether to continue after the program.
Relatedness
<ul style="list-style-type: none"> • To program facilitators/educators—daily emails, Q+A, encouragement of feedback.
<ul style="list-style-type: none"> • To other participants—Facebook group, group Q+A, group check-ins, sharing recipes at potluck.
<ul style="list-style-type: none"> • To family and friends—encourage to sign up with spouse or friend, encourage referrals.
<ul style="list-style-type: none"> • To PCP—encourage working with PCP in preparing for and participating in the program.
Competence
<ul style="list-style-type: none"> • What ingredients do I need? (Shopping list)
<ul style="list-style-type: none"> • What is the best diet and why? (Education)
<ul style="list-style-type: none"> • How do I make it? (Cooking class, recipes, potluck lunch)
<ul style="list-style-type: none"> • How do I address barriers, like eating with family, going to restaurants, etc? (Group discussions)
<ul style="list-style-type: none"> • How do I manage my medications while I am doing the program? (Foster engagement with PCP; discussion with provider on day 1)
<ul style="list-style-type: none"> • What changes do I experience as a result of participating? (Given individual feedback on blood pressure, weight, glucose control, labs, etc; positive feedback reinforces competence).

Abbreviations: Q+A, question + answer; PCP, primary care physician.

foods and foods with added oil or sugar. Foods that provide a concentrated source of natural sugars, such as dried fruits and maple syrup, are limited to 1 tablespoon per day. Patients are advised to eat 1 tablespoon per day of ground flax seeds to provide omega 3 fatty acids. Patients are *not* advised to count calories or control portions. In fact, they are encouraged to eat whenever they are hungry—as long as the food is compliant with the program.

Throughout the entire program, patients get daily emails for

encouragement and skill building. They are invited into a closed Facebook group to build connections within the group.

Quality Improvement Program and Data Collection

Starting in September 2018, data were collected to evaluate and refine the program. Patients were surveyed at baseline and on day 15 for self-reported outcomes. Biometric data (height, weight, vital signs, waist circumference) and point-of-care measurement of fasting glucose and cholesterol profile were completed. A

subset of the participants (n = 75) responded to questions about quality of life, using a 1 to 10 Likert-type scale. A protocol to analyze these data for publication was reviewed by the University of Rochester Research Subjects Review Board and determined to be an exempt study.

Study Design and Participants

This is a cohort study evaluating pre-post quality improvement data collected on all patients who participated in the JS program from September 2018 through February 2020.

Figure 1.

Jumpstart program organization.

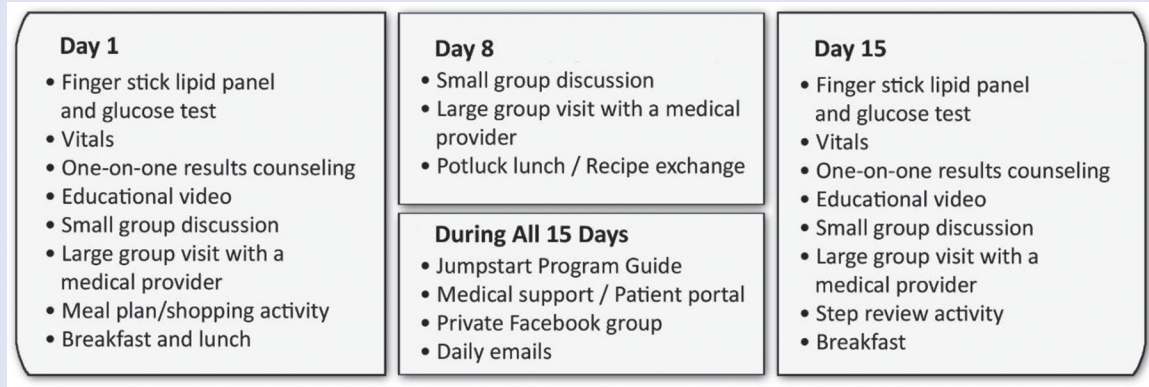


Table 2.

Dietary Pattern Used in the Jumpstart Program^a.

Included	Excluded	Limited
Vegetables	Animal products (meat and dairy)	Ground flax seed—1 TBSP/day
Fruits	High-fat plant foods (nuts/seeds [including butters], olives avocado, coconut)	Concentrated sources of natural sugar (eg, dried fruit, maple syrup)—1 TBSP/day
Whole grains	Processed foods	Alcoholic beverages—1/2 glass of wine, 1/2 beer, or one light beer/day
Legumes (beans, peas, lentils)	Oil, foods with added oil	Caffeine (in moderation)
	Juices	
	Foods with added sugar	
	Artificial sweeteners	

^aPatients are *not* advised to count calories or control portions. They are encouraged to eat whenever they are hungry—as long as the food is compliant with the program.

Statistical Analysis

Differences in pre-post values were calculated via paired *t* tests for all continuous variables. Outcomes are plotted based on day 1 values, and described by baseline level.

Results

Three hundred seventy-six people participated in the program 389 times (13 people took the program twice) from September 2018 through February 2020

and provided quality improvement data. Jumpstart participant demographics are described in Table 3. Average age of participants was 58.4. Almost three fourths were women, and over 90% were White.

Outcomes are presented in Figure 2. Average weight loss over the 15-day program was 5.8 pounds ($P < .0001$; Figure 2a). Of the 327 people who had information on BMI on days 1 and 15, 83.2% of participants were overweight or obese. Of this subgroup, 94.1%

(256/272) lost weight. For people who started with a BMI of 25 to 30, average weight loss was 4.9 pounds ($P < .0001$), and for those who started with a BMI >30, average weight loss was 7.3 pounds ($P < .0001$).

Average drop in systolic blood pressure was 6.8 points from day 1 to day 15 ($P < .0001$; Figure 2b). Of the 337 participants with data for both days, 101 (30.0%) had initial systolic blood pressures of 140 or higher. Average drop for this subgroup was 16.8 points

Table 3.

Participants in the Jumpstart Program.

Characteristic	Value
Age, mean (SD)	58.4 (11.3)
Gender, n (%)	
Male	108 (27.8)
Female	281 (72.2)
Race/ethnicity, n (%)	
White	288 (90.8)
African American	19 (6.0)
Asian	5 (1.6)
Native American	2 (0.6)
Two or more races	2 (0.6)
Hispanic	1 (0.3)

($P < .0001$), and 90 of these (89.1%) had a reduction of their systolic pressure. Average drop in diastolic blood pressure was 2.5 points ($P < .0001$; Figure 2c). Of the 337 participants with data for both days, 86 (25.5%) had diastolic blood pressures of 90 or higher, and their average drop in diastolic blood pressure was 8.0 points ($P < .0001$). Sixty-nine of the 86 participants (80.2%) had a drop in their diastolic blood pressure.

Average drop in total cholesterol was 26 points ($P < .0001$), and 44 points in the subset who started with a cholesterol over 200 ($P < .0001$; Figure 2d). Ninety-three percent (80/86) of this subset had reductions in their cholesterol. High-density lipoprotein (HDL) dropped an average of 8 points ($P < .0001$; Figure 2e). Average drop in low-density lipoprotein (LDL) was 19 points ($P < .0001$), and was 33 points in the subset who started with an LDL over 100 ($P < .0001$; Figure 2f). Forty-five of 107 (42.1%) who started with an LDL >100 had a drop of 30% or more by day 15. Overall, triglycerides dropped by one point for the whole group ($P = .68$), but for the 66/279 who started with a triglyceride level over 150, average drop was 32.7 ($P < .005$), with

83.3% of this subgroup experiencing a drop (Figure 2g).

Average drop in fasting blood sugar was 5.1 points, among the 181 participants with data on days 1 and 15 ($P < .0005$; Figure 2h). For the 25/181 (13.8%) participants who started with fasting sugars in the diabetic range, average drop was 28.4 points ($P < .0001$), and 22/25 (88%) had reductions.

Quality of life improved during the program, according to several measures (Table 4). Energy, sleep, mood, and pain all significantly improved from day 1 to day 15.

Discussion

The 15-day JS is a clinically impactful program, with the majority of participants experiencing positive health changes. Average weight loss was 5.8 pounds. For participants who started with elevated blood pressures, average drop in systolic pressure was 16.8 points, and 8.0 points in diastolic pressure. For participants starting with a total cholesterol over 200, average drop was 44 points. Similar to previous findings in

the CHIP program,¹¹ the worse a patient's health to start with, the larger the benefit from participating in the JS program.

The changes that participants experienced were clinically meaningful. For example, for those who started with fasting blood sugars in the diabetic range, the average drop was 28.4. This translates to a drop in HbA1C of 1.0 point, if sustained over time.²² As a frame of reference, the UK Prospective Diabetes Study compared an intensive regimen versus conventional management for treatment of type 2 diabetes. The difference in HbA1C between the 2 groups was 0.9; this led to a relative reduction of any diabetic endpoint of 12%, and a relative reduction of microvascular events of 25%.²³

For JS participants who started with an LDL above 100, average reduction in LDL was 33 points, or 24.5%. This is in the range of some statins,²⁴ and the changes were seen in just 2 weeks. Side effects from statin medications are myriad, including muscle injury, hepatic and renal dysfunction, and an increased risk of diabetes. With a dietary intervention of WFPB nutrition, there are many positive side effects, and in this program, we saw that energy, sleep, mood, and pain improved. Findings from the CHIP program also demonstrate that the health impact of moving to a WFPB diet goes beyond changes in cardiac risk factors; in a randomized, controlled trial, Merrill and Aldana found significantly greater increases in several patient-centered outcomes, including function, pain, vitality, mental health, and overall health.²⁵

It has been estimated that 45% of adults in the United States have hypertension.²⁶ In the JS program, patients who started with an elevated systolic pressure had an average drop of 16.8 points, and those with an elevated diastolic pressure had an average drop of 8.0 points. This compares favorably to a large meta-analysis of antihypertensive monotherapy, in which most medications led to a 10- to 15-point reduction in systolic pressure, and 8- to 10-point reduction in diastolic pressure.²⁷

Figure 2.
Biometric outcomes.



Interestingly, we found that HDL levels dropped on average by 8 points. This has been seen previously with adopting a WFPB diet.²⁸ It has been suggested that interpreting HDL levels, either as absolute numbers or the ratio of total cholesterol to HDL, may be misleading as an indicator of cardiovascular risk among individuals eating a WFPB diet.²⁹

There is a great deal of confusion in the media as to which diet is optimal to treat chronic illness. The JS program helps address that confusion by demonstrating to patients in 15 days that a WFPB diet can improve both clinical measures and well-being. During the program, patients are told that “you can do anything for 2 weeks”; during that time they can try out the new eating pattern and discover for themselves what adopting a WFPB diet can do.

There are several limitations to this study. The first is that the results are from a quality improvement dataset. These data were collected to aid in developing and optimizing the program. Results are limited to the responses provided by the program and its participants. It will be important to confirm these results with a prospective trial.

Second, although most participants derived benefit from the program, a few did not. We need to better understand what leads to positive results. Understanding issues like social support, readiness for change, actual dietary changes, and participation in the cooking class, and how they impact outcomes, will help optimize results.

Third, this is a short-term intervention. The JS program was designed to quickly increase knowledge and skills in adopting a WFPB diet and to enable participants to demonstrate to themselves what benefits they obtain. We need to better understand the long-term impact of this program, and to develop systems that help patients maintain the changes that they have made.

The population evaluated for this study was predominantly White, and almost three fourths were female, reflecting the population that is currently accessing the JS program. Efforts are underway to

Table 4.Change in Patient-Reported Measures (n = 75)^a.

Characteristic	Pre, mean (SD)	Post, mean (SD)	Change	P
Energy ^b	6.2 (2.1)	7.8 (1.6)	1.6	<.0001
Sleep ^c	5.9 (2.2)	7.5 (1.8)	1.5	<.0001
Mood ^d	7.5 (1.5)	8.3 (1.4)	0.8	<.0001
Pain ^e	5.4 (2.6)	6.7 (2.8)	1.3	<.0005

^aAll numbers are rounded to the nearest tenth.^bEnergy—"On a scale from 0 to 10, how would you rate your energy level?"^cSleep—"On a scale from 0 to 10 how would you rate your sleep?"^dMood—"On a scale from 0 to 10 how would you rate your mood?"^ePain—"On a scale from 0 to 10 how would you rate your pain?"

reach a more diverse patient population, and outcomes for different populations will need to be assessed.

Since the onset of the COVID-19 pandemic, the JS program was converted to an online format. The approach had to be adapted for online learning and interaction. Although, anecdotally, participants have responded well to this format, formal evaluation will be necessary to determine whether outcomes are similar.

Conclusion

By definition, a chronic disease is a condition that lasts 1 year or more and requires ongoing medical attention or limits activities of daily living or both.³⁰ Once established, the comorbidities that the JS program addresses are often considered to be progressive and irreversible. This study demonstrates that adopting an ad lib, Esselstyn-style WFPB diet will rapidly produce positive changes in chronic diseases.

In summary, a 15-day, intensive program that helps patients adopt an Esselstyn-style WFPB diet, without portion-control or calorie-counting, and that uses education, individualized medical feedback, social support, and facilitated small group work, leads to rapid improvements in health. These improvements include weight loss;

reductions in blood pressure, cholesterol, and blood sugar; and positive changes to energy, mood, pain, and sleep. The brevity of the program allows patients experience the benefits of a new eating pattern in a very short period of time. This program also provides a scalable, replicable approach to introducing patients to dietary changes that have the potential for enduring health benefits.

Authors' Note

Preliminary results were presented at the American College of Lifestyle Medicine annual meeting, October 2018.

Declaration of Conflicting Interests

The author(s) declared the following potential conflicts of interest with respect to the research, authorship, and/or publication of this article: Both Susan M. Friedman and Ted D. Barnett practice lifestyle medicine. Susan M. Friedman, Ted D. Barnett, and Carol Hee Barnett are board members of Rochester Lifestyle Medicine Institute (RLMI), a nonprofit organization with a mission to "to establish Lifestyle Medicine, especially the adoption of Whole-Food Plant-Based nutrition, as the foundation for health and the healthcare system." Robert Franki and Beth Garver are employees of RLMI.

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program. Neither organization had input into the development of the program, analysis of outcomes, or presentation of data.

Ethical Approval

A protocol to analyze the data for publication was reviewed by the University of Rochester Research Subjects Review Board and determined to be an exempt study.

Informed Consent

Not applicable, because this article does not contain any studies with human or animal subjects.

Trial Registration

Not applicable, because this article does not contain any clinical trials.

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